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EXAMINER

FAN, CHIEH M

ART UNIT PAPER NUMBER

2634

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/675,928

Applicant(s)

HILDEBRAN ET AL.

Examiner

Chieh M Fan

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 8, 11-21, 23 and 26-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Dicarlo (U.S. Patent No. 5,519,726).

Regarding claim 1, Dicarlo teaches a system for synchronizing a sampling interval at an industrial control module comprising:

a controller (31 in Fig. 3, col. 5, lines 5-11) for providing to a communications link (27A, 27B, 16A, 16B in Fig. 3) a coordinated system time (CST) base signal having a value indicative of a coordinated system time; and

a module (14 in Fig. 3, col. 3, lines 57-60) operatively connected to the communications link, the module having an activation interval for controlling periodic activation relative to at least one of an input and an output thereof;

wherein the module is programmed to synchronize the activation interval thereof relative to the coordinated system time base value (col. 5, line 66 through col. 6, line 7).

Regarding claim 2, wherein the activation interval corresponds to a sampling interval for controlling periodic sampling of at least one input of the module (col. 6, lines 1-7).

Regarding claim 3, Dicarlo also teaches that the module 14 may be an I/O module (col. 3, lines 57-60). The claimed controlling one output of the module is therefore inherent.

Regarding claim 4, the communications link includes at least one of a backplane and a network infrastructure (16A, 16B in Fig. 3).

Regarding claim 5, Dicarlo further teaches a plurality of spatially separated modules (14, 14a, 14b in Fig. 3) operatively connected to the communications link, each of the modules having an activation interval for controlling at least one of periodic sampling of at least one input thereof and periodic applying of data to at least one output, each module synchronizing the activation interval thereof relative to the coordinated system time base value so that the activation interval of each module is coordinated with respect to a common time base (col. 5, line 67 through col. 6, line 1).

Regarding claim 6, the activation interval is user-configurable (col. 2, lines 2-5).

Regarding claim 8, Dicarlo further teaches resynchronization (col. 5, lines 41-56).

Regarding claims 11 and 12, it is known that sampling is performed periodically. Since Dicarlo teaches synchronizing sampling with CST (col. 5, line 66 through col. 6, line 25), the claimed delaying sampling until the CST is integer multiples of the sampling interval (i.e., periodic) is inherent.

Regarding claim 13, Dicarlo teaches a module for use in an industrial controller system comprising:

a communications link (27A, 27B, 16A, 16B in Fig. 3) for receiving a coordinated system time base signal having a value indicative of a coordinated system time (col. 5, lines 5-11); and

a field side for at least one of sampling input data and applying output data (14 in Fig. 3, col. 3, lines 57-60);

wherein the module is programmed to control activation of the field side based on an activation interval value, the module synchronizing the activation interval for the field side relative to the coordinated system time base value (col. 5, line 66 through col. 6, line 7).

Regarding claim 14, it is known that sampling is performed periodically. Since Dicarlo teaches synchronizing sampling with CST (col. 5, line 66 through col. 6, line 25), the claimed delaying sampling until the CST is integer multiples of the sampling interval (i.e., periodic) is inherent.

Regarding claim 15, the activation interval is user-configurable (col. 2, lines 2-5).

Regarding claims 16 and 17, Dicarlo also teaches that the module 14 may be an I/O module (col. 3, lines 57-60). The claimed "input" and "output" are therefore inherent.

Regarding claim 18, Dicarlo teaches a system for providing synchronized sampling at an industrial control module comprising:

means for receiving a coordinated system time base signal at the module having a value indicative of a coordinated system time (col. 5, lines 2-11); and

means for synchronizing an activation interval of the module relative to the coordinated system time base value (col. 5, line 66 through col. 6, line 7).

Regarding claim 19, Dicarlo teaches a method for synchronizing sampling of a module relative to a common time base, the module having an interval for controlling periodic activation relative to at least one of an input and an output thereof, the method comprising the steps of:

receiving a coordinated system time (CST) base signal having a value indicative of a coordinated system time (col. 5, lines 2-11); and

synchronizing the activation interval of the module relative to the coordinated system time base value (col. 5, line 66 through col. 6, line 7).

Regarding claim 20, a plurality of modules (14, 14A, 14B in Fig. 3) receive the coordinated system time base signal and synchronize periodic activation thereof relative to the coordinated system time base value so that the periodic activation at each module is coordinated relative to the common time base (col. 5, line 66 through col. 6, line 1).

Regarding claim 21, the activation interval is user-configurable (col. 2, lines 2-5).

Regarding claim 23, Dicarlo further teaches resynchronization (col. 5, lines 41-56).

Regarding claim 26, it is known that sampling is performed periodically. Since Dicarlo teaches synchronizing sampling with CST (col. 5, line 66 through col. 6, line 25), the claimed delaying sampling until the CST is integer multiples of the sampling interval (i.e., periodic) is inherent.

Regarding claims 27 and 28, Dicarlo also teaches that the module 14 may be an I/O module (col. 3, lines 57-60). The claimed "input" and "output" are therefore inherent.

3. Claims 1-6, 8, 11-21, 23 and 26-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Husted et al. (U.S. Patent No. 5,887,029, listed in the IDS filed 12/26/2000, "Husted" hereinafter).

Regarding claim 1, Husted teaches a system for synchronizing a sampling interval at an industrial control module comprising:

- a controller (31 in Fig. 3, col. 5, lines 45-51) for providing to a communications link (27A, 27B, 16A, 16B in Fig. 3) a coordinated system time (CST) base signal having a value indicative of a coordinated system time; and

- a module (14 in Fig. 3, col. 4, lines 29-32) operatively connected to the communications link, the module having an activation interval for controlling periodic activation relative to at least one of an input and an output thereof;

wherein the module is programmed to synchronize the activation interval thereof relative to the coordinated system time base value (col. 6, lines 40-47; also see col. 7, lines 37-48).

Regarding claim 2, wherein the activation interval corresponds to a sampling interval for controlling periodic sampling of at least one input of the module (col. 6, lines 40-47; also see col. 7, lines 37-48).

Regarding claim 3, Husted also teaches that the module 14 may be an I/O module (col. 4, lines 29-32). The claimed controlling one output of the module is therefore inherent.

Regarding claim 4, the communications link includes at least one of a backplane and a network infrastructure (16A, 16B in Fig. 3).

Regarding claim 5, Husted further teaches a plurality of spatially separated modules (14, 14a, 14b in Fig. 3) operatively connected to the communications link, each of the modules having an activation interval for controlling at least one of periodic sampling of at least one input thereof and periodic applying of data to at least one output, each module synchronizing the activation interval thereof relative to the coordinated system time base value so that the activation interval of each module is coordinated with respect to a common time base (col. 6, lines 40-47).

Regarding claim 6, the activation interval is user-configurable (col. 8, lines 24-42).

Regarding claim 8, Husted further teaches resynchronization (col. 6, lines 14-29).

Regarding claims 11 and 12, Husted further teaches delaying sampling until the CST is integer multiples of the sampling interval (col. 7, line 43).

Regarding claim 13, Husted teaches a module for use in an industrial controller system comprising:

a communications link (27A, 27B, 16A, 16B in Fig. 3) for receiving a coordinated system time base signal having a value indicative of a coordinated system time (col. 5, lines 45-51); and



a field side for at least one of sampling input data and applying output data (14 in Fig. 3, col. 4, lines 29-32);

wherein the module is programmed to control activation of the field side based on an activation interval value, the module synchronizing the activation interval for the field side relative to the coordinated system time base value (col. 6, lines 40-47; also see col. 7, lines 37-48).

Regarding claim 14, Husted teaches delaying sampling until the CST is integer multiples of the sampling interval (col. 7, line 43).

Regarding claim 15, the activation interval is user-configurable (col. 8, lines 24-42).

Regarding claims 16 and 17, Husted also teaches that the module 14 may be an I/O module (col. 4, lines 29-32). The claimed "input" and "output" are therefore inherent.

Regarding claim 18, Husted teaches a system for providing synchronized sampling at an industrial control module comprising:

means for receiving a coordinated system time base signal at the module having a value indicative of a coordinated system time (col. 5, lines 42-51); and

means for synchronizing an activation interval of the module relative to the coordinated system time base value (col. 6, lines 40-47; also see col. 7, lines 37-48).

Regarding claim 19, Husted teaches a method for synchronizing sampling of a module relative to a common time base, the module having an interval for controlling periodic activation relative to at least one of an input and an output thereof, the method comprising the steps of:

receiving a coordinated system time (CST) base signal having a value indicative of a coordinated system time (col. 5, lines 42-51); and

synchronizing the activation interval of the module relative to the coordinated system time base value (col. 6, lines 40-47; also see col. 7, lines 37-48).

Regarding claim 20, a plurality of modules (14, 14A, 14B in Fig. 3) receive the coordinated system time base signal and synchronize periodic activation thereof relative to the coordinated system time base value so that the periodic activation at each module is coordinated relative to the common time base (col. 6, lines 40-48).

Regarding claim 21, the activation interval is user-configurable (col. 8, lines 24-42).

Regarding claim 23, Husted further teaches resynchronization (col. 6, lines 14-29).

Regarding claim 26, Husted teaches delaying sampling until the CST is integer multiples of the sampling interval (i.e., col. 7, line 43).

Regarding claims 27 and 28, Husted also teaches that the module 14 may be an I/O module (col. 4, lines 29-32). The claimed "input" and "output" are therefore inherent.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2634

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dicarlo (U.S. Patent No. 5,519,726) in view of Benson et al. (U.S. Patent No. 6,202,085, "Benson" hereinafter).

Dicarlo teaches the claimed invention (see the rationale applied to claims 1 and 19 above), but does not teach the feature of enable or disable the step of synchronizing.

However, such feature is well known in the art. Ben teaches a synchronization process may be terminated or resumed at desired points (col. 10, lines 29-34).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to add the feature of enable or disable of the step of synchronizing, so as to improve the flexibility of the system.

6. Claims 7 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Husted et al. (U.S. Patent No. 5,887,029, listed in the IDS filed 12/26/2000, "Husted" hereinafter) in view of Benson et al. (U.S. Patent No. 6,202,085, "Benson" hereinafter).

Husted teaches the claimed invention (see the rationale applied to claims 1 and 19 above), but does not teach the feature of enable or disable the step of synchronizing.

However, such feature is well known in the art. Ben teaches a synchronization process may be terminated or resumed at desired points (col. 10, lines 29-34).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to add the feature of enable or disable of the step of synchronizing, so as to improve the flexibility of the system.

7. Claims 9, 10, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dicarlo (U.S. Patent No. 5,519,726) in view of Ernst (EP 0385134).

Regarding claims 9 and 24, Dicarlo teaches the claimed invention (see the rationale applied to claims 1 and 19 above), but does not teach that the resynchronization occurs in response to determining that the periodic activation is occurring at a time relative to the coordinated system time base that is outside of an expected range.

However, initializing resynchronization when the difference between the clock to be synchronized and the reference clock is over a threshold is well known and required to maintain synchronization. Ernst teaches a resynchronization method that tests whether the difference between the clock signal and the reference clock signal exceeds a specified threshold. If the threshold is exceeded, then the resynchronization is started (see the attached equivalent abstract). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate such feature of testing difference to start resynchronization, so as to maintain synchronization.

Regarding claim 10 and 25, it is known that sampling is performed periodically. Since Dicarlo teaches synchronizing sampling with CST (col. 5, line 66 through col. 6, line 25), the claimed delaying sampling until the CST is integer multiples of the sampling interval (i.e., periodic) is inherent.

Art Unit: 2634

8. Claims 9, 10, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Husted et al. (U.S. Patent No. 5,887,029, listed in the IDS filed 12/26/2000, "Husted" hereinafter) in view of Ernst (EP 0385134).

Regarding claims 9 and 24, Husted teaches the claimed invention (see the rationale applied to claims 1 and 19 above), but does not teach that the resynchronization occurs in response to determining that the periodic activation is occurring at a time relative to the coordinated system time base that is outside of an expected range.

However, initializing resynchronization when the difference between the clock to be synchronized and the reference clock is over a threshold is well known and required to maintain synchronization. Ernst teaches a resynchronization method that tests whether the difference between the clock signal and the reference clock signal exceeds a specified threshold. If the threshold is exceeded, then the resynchronization is started (see the attached equivalent abstract). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate such feature of testing difference to start resynchronization, so as to maintain synchronization.

Regarding claims 10 and 25, Husted teaches delaying sampling until the CST is integer multiples of the sampling interval (i.e., col. 7, line 43).

***Response to Arguments***

9. Applicant's arguments filed 11/12/04 have been fully considered but they are not persuasive.

Beginning on page 3 through page 6 of the remark, the applicant argues neither of the DiCarlo and Husted references teaches the claimed "a module programmed to synchronize an activation interval relative to a coordinated system based value."

Examiner's response with respect to the DiCarlo reference --- According to page 2, line 30 through page 3, line 1 of the present application, the present invention relates to a system and/or method for synchronizing one or more modules of an industrial controller to synchronize sampling of input and/or application of output with respect to a time base. To achieve synchronization, the module delays its initial sampling to synchronize periodic sampling relative to the CST signal (see page 9, lines 21-22 of the specification). If the sampling drifts outside calibration limits, the module may periodically resynchronize its sampling, such as based on either the resynchronizing signal or the CST signal. The resynchronization process may occur in substantially the same manner as the initial synchronization (page 9, lines 26-29 of the specification). Therefore, the claimed limitation, "to synchronize an activation interval relative to a coordinated system based value", is merely adjusting the time of initial sampling according to the CST value or activating (or initiating) sampling according to the CST value. On the other hand, as pointed out in this and previous Office Actions, DiCarlo teaches that the modules are instructed to execute a certain action such as sampling a

Art Unit: 2634

signal at a common CST value (col. 6, lines 1-7). Therefore, DiCarlo also teaches initiating sampling or adjusting the time of initial sampling according to the CST value. DiCarlo's teaching reads on the claimed limitation.

Examiner's response with respect to the Husted reference --- The response with respect to the DiCarlo reference is also applied here, since Husted also teaches that the modules are instructed to execute a certain action such as sampling a signal at a common CST value (col. 6, lines 40-47). In addition, Husted further teaches that if a series of samples at precise times are required, the module is instructed to execute the desired action, i.e., sampling, when the predetermined time T is equal to the CST value indicated on its internal clock or when the CST is equal to the predetermined time T plus integer multiple of a predetermined sampling period (col. 7, lines 37-45). On the other hand, in the present application, the module delays its initial sampling to synchronize periodic sampling relative to the CST signal (e.g., initiate sampling when the CST value is an integer multiple of the RTS value) (page 9, lines 21-22 of the specification). Therefore, the teaching of Husted is consistent with the teaching of the present application. Husted teaches the claimed limitation.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (571) 272-3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should



Art Unit: 2634

you have questions on access to the Private PAIR system, contact the Electronic  
Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Chieh M Fan", followed by a large, stylized flourish or checkmark.

Chieh M Fan  
Primary Examiner  
Art Unit 2634

March 29, 2005